

This listing of the claims will replace all prior versions and listings of claims the in the application:

**LISTING OF THE CLAIMS**

Claim 1 (currently amended): A chelated complex comprised of (a) a bacteriocin selected from the group consisting of lantibiotics, non-lanthionine containing peptides, large heat labile proteins and complex bacteriocins, fusion proteins thereof, mixtures thereof, and fragments, homologs and variants thereof, and (b) a detectable label comprising a transition or lanthanide metal; wherein the complex is synthesized or formed *in situ* in a sample to be tested.

Claim 2 (original): The complex of claim 1, wherein the complex binds to microbial cells selected from the group consisting of gram positive bacteria or mycobacteria.

Claim 3 (original): The complex of claim 1, wherein the complex binds to gram negative bacteria or fungi.

Claim 4 (original): The complex of claim 1, wherein the transition metal is selected from the group consisting of Cu, Co, Fe, Mn, Cr, Ni, Zn, Tc, and their isotopes.

Claim 5 (withdrawn): The complex of claim 1, wherein the lanthanide metal is selected from the group consisting of Gd, La, Eu, Tb, Dy, and Er.

Claim 6 (original): The complex of claim 1, wherein the lantibiotic is selected from the group consisting of nisin, mutacin, subtilin, gallidermin, Pep5, epicidin 280, epilancin K7, lactocin S, streptococcin A-FF22, lactacin 481, salivaricin A, variacin, cypemycin, mersacidin, cinnamycin, duramycin and ancovenin, actagardine, sublancin, plantaricin C, fusion proteins thereof, mixtures thereof, and fragments, homologs and variants thereof.

Claim 7 (original): The complex of claim 1, wherein the transition metal is Co.

Claim 8 (original): The complex of claim 1, wherein the bacteriocin is selected from the group consisting of nisin, fusion proteins thereof, mixtures thereof, and fragments, homologs and variants thereof.

Claim 9 (original): The complex of claim 8, wherein the transition metal is Co or Cr.

Claim 10 (withdrawn): A method for synthesizing a bacteriocin-metal complex, comprising: (a) admixing (i) a water soluble salt of metal selected from the group consisting of transition metals and lanthanides with (ii) a bacteriocin selected from the group consisting of lantibiotics, non-lanthionine containing peptides, large heat labile proteins and complex bacteriocins, fusion proteins thereof, mixtures thereof, and fragments, homologs and variants thereof, in (iii) a solvent for the metal salt and the antibiotic, wherein the admixing is conducted under conditions effective to promote chelation of the metal by the bacteriocin, thereby forming a solution of the complex of the bacteriocin and the metal; (b) desalting the complex; and (c) isolating and drying the complex.

Claim 11 (withdrawn): The method of claim 10, wherein the complex binds to gram positive bacteria or mycobacteria.

Claim 12 (withdrawn): The method of claim 10, wherein the complex binds to gram negative bacteria or fungi.

Claim 13 (withdrawn): The method of claim 10, wherein the solvent comprises aqueous buffer.

Claim 14 (withdrawn): The method of claim 10, wherein step (b) comprises dialysis.

Claim 15 (withdrawn): The method of claim 10, wherein step (b) comprises gel filtration.

Claim 16 (withdrawn): The method of claim 10, wherein step (c) comprises freeze-drying.

Claim 17 (withdrawn): The method of claim 10, wherein step (c) comprises spray drying.

Claim 18 (withdrawn): A method for forming a bacteriocin-metal complex *in situ* on a sample to be tested, comprising applying to a sample to be tested (i) a water-soluble salt of metal selected from the group consisting of transition metals and lanthanides and (ii) a bacteriocin selected from the group consisting of lantibiotics, non-lanthionine containing peptides, large heat labile proteins and complex bacteriocins, fusion proteins thereof, mixtures thereof, and fragments, homologs and variants thereof, in (iii) a solvent for the metal salt and the bacteriocin.

Claim 19 (withdrawn): The method of claim 18, wherein the bacteriocin-metal complex binds to a target pathogen.

Claim 20 (withdrawn): The method of claim 18, wherein the transition metal is selected from the group consisting of Cu, Co, Fe, Mn, Cr, Ni, Zn, Tc, and their isotopes.

Claim 21 (withdrawn): The method of claim 18, wherein the lanthanide metal is selected from the group consisting of Gd, La, Eu, Tb, Dy, Er, and their isotopes.

Claim 22 (withdrawn): The method of claim 18, further comprising contacting the sample with an oxidizable substrate and a source of peroxide and measuring luminescence from the sample.

Claim 23 (withdrawn): The method of claim 22, wherein unbound bacteriocin and metal is removed from the sample.

Claim 24 (withdrawn): The method of claim 18, wherein a portion of the sample is removed for detection of pathogens.

Claim 25 (withdrawn): The method of claim 24, wherein the portion of sample is removed by washing.

Claim 26 (withdrawn): The method of claim 24, wherein the portion of sample is removed and pathogens are suspended in aqueous buffer solution.

Claim 27 (withdrawn): The method of claim 24, wherein the portion of sample removed for detection of pathogens is concentrated.

Claim 28 (withdrawn): The method of claim 27, wherein the pathogens are concentrated by a method selected from the group consisting of centrifugation, filtration or adsorption.

Claim 29 (withdrawn): The method of claim 28, wherein the adsorption is performed by adsorptive particles selected from the group consisting of immuno-microbeads and phage-microbeads.

Claim 30 (withdrawn): The method of claim 22, wherein the oxidizable substrate is selected from the group of chemiluminescent substrates consisting of luminol and its derivatives, lucigenin, penicillin, luciferin and other polyaromatic phthalylhydrazides.

Claim 31 (withdrawn): The method of claim 22, wherein the peroxide source is hydrogen peroxide, benzoyl peroxide or cumyl peroxide.

Claim 32 (withdrawn): The method of claim 22, wherein the peroxide source is an enzyme such as glucose oxidase or amino acid oxidase.

Claim 33 (withdrawn): A diagnostic test for conducting a chemiluminescent assay of bacteria or fungi, comprising: the complex of claim 1, a peroxide source and oxidizable substrate.

Claim 34 (withdrawn): The diagnostic test of claim 33, wherein the oxidizable substrate is selected from the group of chemiluminescent substrates consisting of luminol and its derivatives, lucigenin, penicillin, luciferin and other polyaromatic phthalylhydrazides.

Claim 35 (withdrawn): The diagnostic test of claim 33, wherein the peroxide source is hydrogen peroxide, benzoyl peroxide or cumyl peroxide.

Claim 36 (withdrawn): The diagnostic test of claim 33, wherein the peroxide source is an enzyme such as glucose or amino acid oxidase.

Claim 37 (withdrawn): The diagnostic test of claim 33, wherein the bacteria are gram positive bacteria, gram negative bacteria or mycobacteria.

Claim 38 (withdrawn): The diagnostic test of claim 33, wherein fungi are detected.

Claim 39 (withdrawn): A method for conducting a chemiluminescent assay of pathogens comprising (a) contacting a sample with the complex of claim 1, (b) removing unbound complex and (c) detecting pathogens by contacting the sample with a peroxide source and an oxidizable substrate.

Claim 40 (withdrawn): The method of claim 39, wherein pathogens are isolated from the sample prior to contacting the sample with the chelated complex.

Claim 41 (withdrawn): The method of claim 39, wherein pathogens are isolated from the sample using antibody-attached microbeads or phage-attached microbeads.

Claim 42 (withdrawn): The method of claim 39, wherein the microbeads comprise a magnetic material.

Claim 43 (withdrawn): The diagnostic test of claim 33, further comprising combining bacteria or fungi labeled with the chelated complex of claim 1 with peroxide with an oxidizable substrate, and detecting light emission in a photodetector.

Claim 44 (withdrawn): The method of claim 39, wherein the peroxide source is hydrogen peroxide, benzoyl peroxide and cumyl peroxide.

Claim 45 (withdrawn): The method of claim 39, wherein the oxidizable substrate is selected from the group consisting of luminol and its derivatives, lucigenin, penicillin, luciferin and other polyaromatic phthalylhydrazides.

Claim 46 (withdrawn): The method of claim 39, wherein the pathogens are gram positive bacteria or mycobacteria.

Claim 47 (withdrawn): The method of claim 39, wherein the pathogens are gram negative bacteria or fungi.

Claim 48 (withdrawn): A therapeutic treatment comprising a chelated complex comprised of (a) lantibiotics, non-lanthionine containing peptides, large heat labile proteins and complex bacteriocins, fusion proteins thereof, mixtures thereof, and fragments, homologs and variants thereof, and (b) a detectable label comprising a transition or lanthanide metal, wherein the tissue of a patient is treated with the chelated complex.

Claim 49 (withdrawn): The therapeutic treatment of claim 48, wherein the transition metal is Cobalt.

Claim 50 (withdrawn): The therapeutic treatment of claim 48, wherein the lantibiotic is nisin.

Claim 51 (withdrawn): The diagnostic test of claim 33, wherein the bacteria are selected from the group consisting of lactococci, leuconostocs, micrococci, pediococci, actinomyces, mycobacteria, pneumococci, streptococci, staphylococci, aerobic bacilli, anaerobic clostridia, listeria and nocardia.

Claim 52 (withdrawn): The diagnostic test of claim 51, wherein the mycobacteria are selected from the group consisting of *mycobacterium tuberculosis*, *mycobacterium avium*, *mycobacterium paratuberculosis*, *mycobacterium bovis* and *mycobacterium leprae*.

Claim 53 (withdrawn): The diagnostic test of claim 51, wherein the bacteria are selected from the group consisting of *Bacillus anthracis*, *Clostridium botulinum* and *Clostridium perfringes*.

Claim 54 (withdrawn): The method of claim 39, wherein the bacteria are selected from the group consisting of lactococci, leuconostocs, micrococci, pediococci, actinomyces, mycobacteria, pneumococci, streptococci, staphylococci, aerobic bacilli, anaerobic clostridia, listeria and nocardia.

Claim 55 (withdrawn): The method of claim 54, wherein the mycobacteria are selected from the group consisting of *mycobacterium tuberculosis*, *mycobacterium avium*, *mycobacterium paratuberculosis*, *mycobacterium bovis* and *mycobacterium leprae*.

Claim 56 (withdrawn): The method of claim 54, wherein the bacteria are selected from the group consisting of *Bacillus anthracis*, *Clostridium botulinum* and *Clostridium perfringes*.

Claim 57 (withdrawn): A method for synthesizing a lantibiotic-metal complex, comprising (a) admixing (i) a water soluble salt of metal selected from the group consisting of transition metals and lanthanides with (ii) a lantibiotic selected from the group consisting of nisin, mutacin, subtilin, gallidermin, Pep5, epicidin 280, epilancin K7, lactocin S, streptococcin A-FF22, lactacin 481, salivaricin A, variacin, cypemycin, mersacidin, cinnamycin, duramycin and ancovenin, actagardine, sublancin, plantaricin C, fusion proteins thereof, mixtures thereof, and fragments, homologs and variants thereof, in (iii) a solvent for the metal salt and the lantibiotic, wherein the admixing is conducted under conditions effective to promote chelation of the metal by the lantibiotic, thereby forming a solution of the complex of the lantibiotic and the metal; (b) desalting the complex; and (c) isolating and drying the complex.

Claim 58 (withdrawn): The method of claim 57, wherein the solvent comprises aqueous buffer.

Claim 59 (withdrawn): The method of claim 57, wherein step (b) comprises dialysis.

Claim 60 (withdrawn): The method of claim 57, wherein step (b) comprises gel filtration.

Claim 61 (withdrawn): The method of claim 57, wherein step (c) comprises freeze drying.

Claim 62 (withdrawn): The method of claim 57, wherein step (c) comprises spray drying.

Claim 63 (withdrawn): The complex of claim 1, wherein the lantibiotic is selected from the group consisting of nisin, mutacin, subtilin, gallidermin, Pep5, epicidin 280, epilancin K7, lactocin S, streptococcin A-FF22, lacticin 481, salivaricin A, variacin, cypemycin, mersacidin, cinnamycin, duramycin and ancovenin, actagardine, sublancin, plantaricin C, mixtures thereof and fragments, analogs and variants thereof, and the lanthanide metal is selected from the group consisting of Gd, La, Eu, Tb, Dy, and Er, and their isotopes.

Claim 64 (original): The complex of claim 1, wherein the lantibiotic is selected from the group consisting of nisin, mutacin, subtilin, gallidermin, Pep5, epicidin 280, epilancin K7, lactocin S, streptococcin A-FF22, lacticin 481, salivaricin A, variacin, cypemycin, mersacidin, cinnamycin, duramycin and ancovenin, actagardine, sublancin, plantaricin C, mixtures thereof and fragments, analogs and variants thereof, and the transition metal is selected from the group consisting of Cu, Co, Fe, Mn, Cr, Ni, Zn, Tc, and their isotopes.

Claim 65 (withdrawn): The complex of claim 1, wherein the bacteriocin comprises the amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO:8 or a nucleic acid sequence that hybridizes with SEQ ID NO:8 under stringent conditions.



Claim 66 (original): The complex of claim 1, wherein the bacteriocin comprises the amino acid sequence of SEQ ID NOS: 1-7, or the amino acid sequence of SEQ ID NOS: 1-7 having a substitution, deletion or addition of 1 to 3 amino acids.

Claim 67 (original): The complex of claim 1, wherein the bacteriocin comprises the amino acid sequence of SEQ ID NOS: 1-7 or an amino acid sequence that is 90% homologous with the amino acid sequence of SEQ ID NOS: 1-7.

Claim 68 (withdrawn): A method for forming a bacteriocin-metal complex *in situ* on a sample to be tested, comprising applying to a sample to be tested: (i) a water-soluble salt of metal selected from the group consisting of transition metals and lanthanides and (ii) a bacteriocin, wherein the bacteriocin comprises the amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO:8 or a nucleic acid sequence that hybridizes with SEQ ID NO:8 under stringent conditions; in (iii) a solvent for the metal salt and the bacteriocin.

Claim 69 (withdrawn): A method for forming a bacteriocin-metal complex *in situ* on a sample to be tested, comprising applying to a sample to be tested: (i) a water-soluble salt of metal selected from the group consisting of transition metals and lanthanides and (ii) a bacteriocin, wherein the bacteriocin comprises the amino acid sequence of SEQ ID NOS: 1-7, or the amino acid sequence of SEQ ID NOS: 1-7 having a substitution, deletion or addition of 1 to 3 amino acids; in (iii) a solvent for the metal salt and the bacteriocin.

Claim 70 (withdrawn): A method for forming a bacteriocin-metal complex *in situ* on a sample to be tested, comprising applying to a sample to be tested: (i) a water-soluble salt of metal selected from the group consisting of transition metals and lanthanides and (ii) a bacteriocin, wherein the bacteriocin comprises the amino acid sequence of SEQ ID NOS: 1-7 or an amino acid sequence that is 90% homologous with the amino acid sequence of SEQ ID NOS: 1-7; in (iii) a solvent for the metal salt and the bacteriocin.

Claim 71 (withdrawn): A method for conducting a chemiluminescent agglutination assay for an analyte comprising (a) providing *Staphylococcus aureus* cells with antibodies to the analyte bound thereto, (b) contacting a sample with the *Staphylococcus* cells, (c) allowing the antibodies to bind to the analyte and agglutinate the *Staphylococcus* cells, (d) separating the agglutinated cells from the non-agglutinated cells, (e) contacting the agglutinated cells with a bacteriocin and a transition or lanthanide metal, (f) optionally removing unbound complex and (g) detecting the presence of the analyte by contacting the sample with a peroxide source and an oxidizable substrate.

Claim 72 (withdrawn): A method for conducting a chemiluminescent agglutination assay for viruses or prions comprising (a) providing *Staphylococcus aureus* cells with antibodies to viruses or prions bound thereto, (b) contacting a sample with the *Staphylococcus* cells, (c) allowing the antibodies to bind to viruses or prions and agglutinate the *Staphylococcus* cells, (d) separating the agglutinated cells from non-agglutinated cells, (e) contacting the agglutinated cells with a bacteriocin and a transition or lanthanide metal, (f) optionally removing unbound complex and (g) detecting the presence of viruses or prions by contacting the sample with a peroxide source and an oxidizable substrate.